

REMARKS

In view of the above amendments and the following remarks, reconsideration and further examination are requested.

By this amendment, various minor editorial amendments have been made to claims 9-15 in order to use conventional "means plus function" language. Also, claim 16 has been amended to make clear that the claim is not to be construed under 35 USC 112, sixth paragraph. New apparatus claims 17-23 have been added to include apparatus claims similar in subject matter to claims 9-16, but written in such a way as not to be construed under 35 USC 112, sixth paragraph. Claims 24-30 have been added to include further recitations.

As required, the abstract has been amended to include 150 or fewer words. A substitute abstract along with a marked-up version of the substitute abstract are submitted herewith. Also, the specification has been reviewed and various editorial amendments have been made thereto without adding new matter.

Claims 9, 10, 13, 14, 15, and 16 were rejected under 35 USC 102(b) as being anticipated by Ando. This rejection is traversed and is submitted to be inapplicable to claims 9, 10, 13-16, and new claims 17-30 for the following reasons.

For clarity, following remarks refer to means plus function language of the claims, but the remarks are equally applicable to the corresponding non-means language of the new apparatus claims.

The Examiner asserts that the optical element (hologram element) 20A shown in Fig. 6 of Ando corresponds to the output controlling means which controls output of the light source in claim 9 of the present invention. Further, the Examiner asserts that Ando discloses the features recited in claim 9, which are "the output controlling means holds learned data as to a relation between a driving amount to be inputted to the wavefront converting means and the output of the light source" in paragraph 0233, and "the output controlling means controls the output of the light source based on the driving amount to be inputted to the wavefront converting means and the leaned data, the driving amount being changed depending on the aberration of the focus light spot" in paragraphs 0391 and 0413.

However, Ando merely discloses in paragraph 0233 "the optical element (hologram element 20A) having a light splitting function for focusing light (LB) from the light source (10) onto a plurality of focusing positions on the recording surface of the information medium (100)". Ando neither discloses nor suggests "the output controlling means which controls output of the light source", or "the output controlling means holds learned data as to the relation between the driving amount to be inputted to the wavefront converting means and the output of the light source" as recited in claim 9.

Ando also discloses in paragraph 0391 "If the focus deviates to a position farther from objective lens 60 than the surface of the recording layer of the medium, an elliptic beam spot elongated in the array direction of cells a and c is formed, output (cell a + cell c) from adder 211 becomes larger than output (cell b + cell d) from adder 212. As a consequence, negative output $[-(a+c) + (b+d)]$ corresponding to the focus deviation amount is output from subtracter 223. When this negative output $[-(a+c) + (b+d)]$ is supplied to driving current supply circuit 281 through phase compensation circuit 271 to supply a corresponding driving current from driving current supply circuit 281 to defocusing correction driving coil 62, the position of objective lens 60 is adjusted to reduce output $[-(a+c) + (b+d)]$ from subtracter 223 to zero (or a minimum value). When output $[-(a+c) + (b+d)]$ from subtracter 223 becomes zero (or a minimum value), the focus deviation farther from objective lens 60 than the surface of the recording layer of medium is corrected." Paragraph 0391 of Ando describes a method for driving the defocusing correction driving coil 62 for driving an objective lens 60. However, it is neither disclosed nor suggested in Ando that the output controlling means controls the output of the light source based on the driving amount to be inputted to the wavefront converting means and the learned data, the driving amount being changed depending on the aberration of the focus light spot, as recited in claim 9 (and recited in non-means language in claim 17).

Further, Ando discloses in paragraph 0413 "Subtractor 225 outputs a signal that becomes zero (or minimized) when the focused spot size (spot area) of sub-beam A becomes equal to the focused spot size (spot area) of sub-beam B. The output signal from subtracter 225 is supplied to driving current supply circuit 283 through phase compensation circuit 273. Driving current supply circuit

283 supplies thickness irregularity correction convex lens driving coil 54 in Fig. 6 with a driving current having a polarity and magnitude that make the output signal from subtracter 225 become zero (or minimized). Then, the position of thickness irregularity correction concave lens 50 and/or the position of thickness irregularity correction convex lens 52 in Fig. 6 is adjusted to match the focused spot size (spot area) of sub-beam A to the focused spot size (spot area) of sub-beam B. If the output signal from subtracter 225 becomes zero (or minimized) as a result of this operation, it indicates that the thickness irregularity of the medium transparent layer is corrected." Paragraph 0413 of Ando describes a method for driving the thickness irregularity correction convex lens driving coil 54 for driving the thickness irregularity correction convex lens 52. However, it is merely disclosed therein that the driving amount of the wavefront converting means is changed depending on the aberration of the focus light spot. Accordingly, neither description nor suggestion is found in Ando with respect to "the output controlling means controls the output of the light source based on the driving amount to be inputted to the wavefront converting means and the learned data, the driving amount being changed depending on the aberration of the focus light spot".

As mentioned above, the hologram element 20A disclosed in Ando is used to split the light (LB) outputted from a light source (10) so as to generate a main beam and a sub-beam (See the paragraph 0237 of Ando). Thus, the hologram element 20A is not used to control the output of the light source (the power of the beam outputted from the light source). Accordingly, the hologram element 20A does not have the learned data as to a relation between a driving amount to be inputted to the wavefront converting means and the output of the light source, and does not control the output of the light source (the power of the beam outputted from the light source) based on the driving amount to be inputted to the wavefront converting means and the learned data, the driving amount being changed depending on the aberration of the focus light spot.

Thus, Ando neither discloses nor suggests "the output controlling means which controls output of the light source", or "the output controlling means holds learned data as to a relation between a driving amount to be inputted to the wavefront converting means and the output of the light source, and controls the output of the light source based on the driving amount to be inputted to the wavefront converting means and the learned data, the driving amount being changed

depending on the aberration of the focus light spot" as recited in claim 9 (and recited in non-means language in claim 17).

With regard to Claim 16, the Examiner asserts that Ando discloses in the paragraph 0373 "learning in advance a relation between a driving amount by which wavefront converting means is to be operated so as to reduce an aberration of the focus light spot, and an output of the light source" as recited in claim 16. Further, the Examiner also asserts that Ando discloses in the paragraph 0396 "controlling the output of the light source based on the driving amount of the wavefront converting means" as recited in claim 16.

However, Ando discloses in the paragraph 0373 "Transparent layer thickness irregularity (refractive index irregularity) detection/correction control circuit system (thickness servo system) 500 is configured to drives thickness irregularity correction convex lens driving coil (and/or thickness irregularity correction concave lens driving coil) 54 on the basis of photodetection outputs from cells e, f, g, and h constituting sub-beam A detection two-division cell 94 and sub-beam B detection two-division cell 96, thereby suppressing or eliminating a phenomenon in which the focused spot size of main beam M increases even if main beam M is controlled by focusing servo system 600 to come into the best focus (due to the influence of spherical aberration originating from medium transparent layer thickness irregularity and/or refractive index irregularity)." Paragraph 0373 of Ando describes a method for driving the thickness irregularity correction convex lens driving coil 54 for driving the thickness irregularity correction convex lens 52. Thus, neither description nor suggestion is found in Ando with respect to "learning in advance a relation between a driving amount by which wavefront converting means is to be operated so as to reduce an aberration of the focus light spot, and an output of the light source".

Further, Ando discloses in the paragraph 0396 "output (a+b) from adder 214 is supplied to the (+) input terminal of subtracter 224, and output (b+c) from adder 213 is supplied to the (-) input terminal of subtracter 224. As a consequence, subtracter 224 outputs the difference (tracking error signal) [(a+d) - (b+c)] between photodetection outputs obtained by splitting the beam spot into two parts, i.e., left and right parts, in the track running direction of groove G or land L. If the driving current to tracking deviation correction driving coil 64 is controlled to reduce this output (tracking

error signal) to zero or minimum value, automatic control can be performed to move the center of the focused spot of main beam M onto a groove or land center of the recording layer of the medium. This automatic control will be referred to as tracking servo control based on the push-pull method." Paragraph 0396 of Ando describes a method for driving the tracking deviation correction driving coil 64 which drives an objective lens 60. Thus, neither description nor suggestion is found in Ando with respect to "controlling the output of the light source based on the driving amount of the wavefront converting means".

As mentioned above, Ando neither discloses nor suggests the features of claim 16, including "learning in advance a relation between a driving amount by which wavefront converting means is to be operated so as to reduce an aberration of the focus light spot, and an output of the light source" and "controlling the output of the light source based on the driving amount of the wavefront converting means".

Because of the above distinctions, it is submitted that claims 9, 10, 12-16, and 17-30 are not anticipated by Ando.

Claim 11 was rejected under 35 USC 103(a) as being unpatentable over Ando in view of Itou. Claim 12 was rejected under 35 USC 103(a) as being unpatentable over Ando in view of Yoshida. These rejections are traversed and are submitted to be inapplicable to claims 11, 12, 19, and 20 for the following reasons.

Neither Itou (US 2002/0024736) nor Yoshida (US 6,381,074) discloses or suggests "the output controlling means which controls output of the light source" or "the output controlling means holds learned data as to a relation between the driving amount to be inputted to the wavefront converting means and the output of the light source, and controls the output of the light source based on the driving amount to be inputted to the wavefront converting means and the learned data, the driving amount being changed depending on the aberration of the focus light spot" as recited in claim 9 (and recited in non-means language in claim 17). Accordingly, it is submitted that the inventions of claims 11, 12, 19, and 20 would not have been obvious to a person having ordinary skill in the art in view of any combination of Ando with Itou or Yoshida.

In view of the above, it is submitted that the present application is in condition for allowance.
The Examiner is invited to contact the undersigned by telephone to resolve any remaining issues.

Respectfully submitted,

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